Name:

**Natural Selection Virtual Activity**

This activity will give students the opportunity to examine and to understand the mechanisms of natural selection. This material is covered in depth in the eText but is briefly summarized below.

1. Overproduction of offspring
2. Variation in the population as a result of meiosis, sexual reproduction, and mutation (heritable characteristics)
3. Struggle for survival because there is not enough resources for all members of population
4. Differential Survival as those best fit for the environment are more likely to survive
5. Those that can survive can pass on their genes to the next generation

*Instructions:* Go to the Natural Selection Simulation on the Wiki (Click-to-Run). Open the widget (it will need to download). If you cannot open from the Wiki you can also visit this website <https://phet.colorado.edu/en/simulation/natural-selection>

1) Click “Add a friend” one time. There should now be two white bunnies. Let the simulation run and observe what happens to the population of bunnies over time. Record your observations below:

2) Click “Reset All” to clear the previous results and start the simulation again. Click “Add a friend” one time. There should now be two white bunnies. Let the simulation run until there are about 5-10 bunnies. Click on “Wolves” under the “Selection Pressure” to add in predators. Observe what happens to the population of white bunnies over time. Record your observations. Why do you think this occurs?

2a) REPEAT THIS STEP TWO MORE TIMES. Did you observe the same results each time?

3) Click “Reset All” to clear the previous results and start the simulation again. Click “Add a friend” one time. There should now be two white bunnies. Let the simulation run until there are about 5-10 bunnies. Click on “ADD A MUTATION” to add in a brown fur mutation and also click WOLVES to under “Selection Pressure”. Observe what happens to the population of bunnies over time. Record your observations. How is this different than step 2? Why does this difference occur?

3a) REPEAT THIS STEP TWO MORE TIMES. Did you observe the same results each time?

4) Click “Reset All”. Change the environment to “ARTIC”. Before you begin, make a hypothesis about which bunnies (white or brown) would better survive in the arctic environment. Why?

5) Repeat step 3 (add mutation, add wolves). Record your observations. What happened? Did the results match your hypo? How is this different than Step 3? Why does this difference occur?

5a) REPEAT THIS STEP TWO MORE TIMES. Did you observe the same results each time?

6) Choose another combination of characteristics and selection pressures. State the selections you made, your predictions of what the results might be, the results you obtained, and the explanation of why your results matched or did not match your prediction.